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WELFARE STATE STRUCTURE, INEQUALITY, AND PUBLIC ATTITUDES TOWARDS PROGRESSIVE TAXATION

ABSTRACT

Recent research indicates that while higher tax levels are politically unpopular, greater tax progressivity is not. However, there remain unanswered questions regarding public support for more progressive taxation. In particular, little is known about how individual attitudes towards tax progressivity are affected by their institutional context. Building on existing theories of redistribution, this paper develops the argument that the structure of the welfare state shapes public attitudes towards progressive taxation - support for progressive taxation among both average and high-income households is undermined by 'pro-poor' welfare spending. We support our argument with a cross-sectional analysis of rich democracies, interacting household income with country-level indicators of welfare state structure. In doing so, we contribute a micro-level explanation for the paradoxical macro-level phenomenon that larger, more redistributive welfare states tend to be financed by less progressive tax systems.

Keywords: **progressive taxation, individual attitudes, welfare state, income inequality**

JEL: **H20 – H53 – I38**

1. INTRODUCTION

Recent research on individual tax preferences indicates that while higher tax levels are politically unpopular, greater tax progressivity is not (Barnes, 2015, Roosma et al., 2015, Ballard-Rosa et al., 2016). This will be of interest to governments seeking politically feasible means of redistribution where the scope for increasing state spending is limited. However, with research into individual tax preferences in its infancy in comparative politics, there are still many unanswered questions regarding public support for more progressive taxation. In particular, we still know very little about how public attitudes towards progressive taxation are affected by their institutional context.

In this paper, we examine the effect of welfare state structure on public attitudes towards progressive taxation. Building on a rich literature on redistribution preferences, we develop the argument that support for progressive taxation is eroded where welfare spending is targeted on the poor. By contrast, welfare states that spend relatively more on insuring the risks faced by average and higher income earners foster greater public support for tax progressivity.

Our argument implies that individuals take the distribution of benefits into account when forming preferences about who should bear the burden of paying for them. More controversially, in light of influential research on inequality and redistribution preferences (Meltzer and Richard, 1981, Lupu and Pontusson, 2011, Finseraas, 2008, Moene and Wallerstein, 2001), we show that it is the distribution of benefits *per se* and not the resulting distribution of disposable income – or indeed market income inequality - that shapes support for progressivity on the revenue side of the welfare state.

We support our argument empirically with a cross-sectional analysis of advanced post-industrial democracies. Our analysis combines individual level data from the ISSP's (2006) *Role of Government* survey with country-level data on market and disposable income inequality, and country-level indicators of the distribution of welfare benefits, including a measure of the extent to which welfare expenditure is 'pro-poor' that we create using data from the OECD Social Expenditure Database (SOCX).

Our results contribute to ongoing efforts to understand the politics of redistribution holistically, by asking both 'who gives' and 'who gains' from diverse institutional contexts (Beramendi and Rehm, 2016). By linking 'pro-poor' welfare state spending to lower public support for tax progressivity, we also contribute to recent work that has tried to explain the paradoxical macro-level phenomenon that larger, more redistributive welfare states tend to be financed by less progressive tax systems (Beramendi and Rueda, 2007, Kato, 2003).

In the next section, we review the literature on tax and redistribution preferences, and set up our argument. Section three presents our empirical analysis and robustness tests, and in the final section of the paper we discuss our results and their implications.

2. EXPLAINING PUBLIC ATTITUDES TOWARDS PROGRESSIVE TAXATION

Recent research has made headway in explaining individual attitudes towards tax progressivity. High-income individuals are less likely to support progressive tax policies than low-income individuals, since progressive taxation is increasingly costly for higher income earners (Barnes, 2015, Heinemann and Hennighausen, 2015, Edlund, 2003). Relative income in particular is strongly associated with tax progressivity preferences, with support for progressive taxation declining the further an individual is above the mean income (Rueda and Stegmueller, 2015a, Finseraas, 2008).

Following the same interest-based logic, tax progressivity preferences are also related to the *risk* of low income. Although individuals with specific skills are not more likely to support progressive taxation, those in occupations with higher occupational unemployment rates are (Barnes, 2015). Higher education levels, which reduce the risk of economic hardship and increase lifetime income (Rehm, 2011, Rueda and Idema, 2011) are also associated with less support for progressive taxation (Barnes, 2015). In addition to income and economic risk, support for progressive taxation is associated with lower occupational class and lower subjective social class (Roosma et al., 2015), lower political trust (Roosma et al., 2015, Barnes, 2015), and left-wing political affiliation (Roosma et al., 2015).

There is also evidence that individuals do not necessarily choose the tax system that is most beneficial to their own material advantage, since they may also care about its fairness or general need. Hence even high-income individuals may support a tax system where they have to pay a larger share of their income in taxes than low-income earners (Berens and von Schiller, 2016). The literature on inequality aversion identifies the phenomenon of 'advantageous inequality aversion' or 'altruism' - experiencing utility losses when others have worse economic outcomes - and shows the relevance of this on tax progressivity preferences (Ackert et al., 2007, Lü and Scheve, 2014). Advantageous inequality aversion is linked to an individual's causal beliefs about the economy and social mobility. In particular, Heinemann and Hennighausen (2015) find the belief that 'inequality results from differences in individual effort' and the belief that 'taxation disincentivises individual effort' each have an independent effect on tax progressivity preferences, reducing support for progressive taxation.

While micro-level determinants of support for tax progressivity are well understood, it is less clear how individual tax preferences are affected by institutional context. Substantial cross-

national differences in support for progressive taxation are not straightforwardly related to welfare regimes, nor do they correspond to tax levels or to the progressivity of the existing tax system (Roosma et al., 2015, Barnes, 2015). In fact, very little attention has been paid to how the institution that ought to be most directly relevant to shaping support for progressive taxation – the welfare state – affects individual preferences.

There is however a rich literature on the effect of the welfare state context on public support for redistribution and welfare spending, and in the remainder of this section we draw on this to develop expectations about public support for progressive taxation. It is important to note at the outset that support for progressive taxation is not the same thing as support for redistribution, nor is it the same thing as support for high or progressive welfare spending. Progressive taxation means shifting the tax burden to higher-income earners, and it is a means through which redistribution can be attained. But redistribution can also be attained through higher levels of taxation and spending, and through more progressive benefit structures. Thus for example individuals in favor of redistribution might - and in fact often do (see Barnes, 2015) - support more progressive taxation but not higher or more progressive welfare state spending. A preliminary test shows that there is a very low correlation ($\rho = 0.218$) between support for progressive taxation and support for the statement that government should seek to reduce income differences[1].

2.1 'We are happy to give… but only if we get it back'

The institutionalist idea that the structure of the welfare state influences policy preferences has a long pedigree. Within the comparative welfare state literature, it is a classic argument that each of the Social Democratic, Conservative, and Liberal welfare regimes will 'produce its own unique fabric of social solidarity' (Esping-Andersen, 1990: 58). While Esping-Andersen highlights how welfare regimes structure the interests of broad social classes, Pierson's (2001) logic of path dependence emphasizes the individual-level interests of a 'welfare clientele' that is in receipt of benefits or employed by the state. By both accounts, existing welfare arrangements shape the extent to which it is in people's interest to support the welfare state - public support should be strong in Social Democratic regimes, moderate in Conservative regimes, and low in Liberal regimes. These expectations have been influential, and have received considerable - if qualified - empirical support (see Larsen, 2008, for an overview).

In a similar vein, Moene and Wallerstein (2001) argue that cross-national differences in public support for government spending on welfare can be understood if a distinction is made between two separate functions of the welfare state. On the one hand, welfare states fulfill a 'redistributive' function, transferring resources from richer individuals to poorer individuals. At the same time, they fulfill an 'insurance' function against the loss of income from the realization

of various social risks. Since having a low income motivates support for government spending on redistribution, and having a high income motivates support for government spending on insurance, welfare states will generate different patterns of public support depending on the extent to which they emphasize redistributive spending 'targeted to those without earnings', or spending on insurance against loss of earnings (e.g. on unemployment insurance, disability benefits, and ALMPs).

Departing from the same underlying assumption, namely that an individual's support for financing the welfare state depends on the extent to which they are eligible to receive the benefits of welfare spending, Korpi and Palme (1998, also more recently Brady and Bostic, 2015) make a similar argument. Welfare systems characterized by earnings-related benefits, which 'follow the biblical Mathew principle of giving more, in absolute terms, to the rich rather than the poor' (Korpi and Palme, 1998: 672), are likely to enjoy high levels of popular support as it is not only the poor but also the middle classes that benefit from them. By contrast, welfare states that rely heavily on 'low income targeting' or 'low levels of universal benefits', and hence give more to low-income earners than to the better off, are likely to erode popular support as the middle classes have little to gain from them.

Following these institutionalist logics, we might expect high income individuals to be less opposed to increasing the progressivity of the tax system when the welfare spending that it funds is less targeted to those with low (or no) earnings. That is, we might expect that the rich will be more willing to take on a greater share of the burden of financing the welfare state, the more likely it is that some of the benefits provided will accrue to them. For those with average incomes, welfare state spending that is geared towards insurance rather than redistribution is even more likely to bolster support for more progressive taxation than it is for the rich. This is because while the rich are likely to assume that more progressive taxation implies an increase in their own tax share, average earners are likely to assume that greater tax progressivity will be costly only to others. With this in mind, if average earners are primary beneficiaries of welfare state expenditure, it is a 'no brainer' - in interest-based terms - for them to support greater tax progressivity[2].

2.2 'We are happy to give… but only to those who deserve it'

Institutionalist arguments about how welfare state structure affects support for the welfare state are not always interest-based. Building on increasingly influential work highlighting the importance of perceptions of fairness alongside self-interest in explaining welfare attitudes (Ackert et al., 2007, Lü and Scheve, 2014, Heinemann and Hennighausen, 2015, Scheve and Stasavage, 2016), an interesting strand of institutionalist research asks how welfare state structure influences or 'frames' the way the public perceives the 'deservingness' of benefit recipients.

This literature identifies a number of criteria individuals must meet if they are to be considered 'deserving' of benefits by others. People are more likely to express support for welfare benefits if they consider that the recipients of these benefits have no control over their eligibility (i.e. if recipients are not responsible for their need); if they identify with or feel 'social affinity' with the recipients; and if they consider that the benefit recipients are likely to reciprocate financially over their life course (Larsen, 2008, Oorschot, 2006).

As a result, social assistance benefits consistently receive the lowest levels of public support compared to other types of welfare spending. Recipients of social assistance are often seen as having control over their benefit eligibility - the public is able to question whether they 'could get a job if they wanted' (Larsen, 2008), or more generally whether they are 'to blame for their predicament' (Rothstein, 1998: 158)[3]. In addition, social assistance erodes the social affinity that the middle classes feel with benefit recipients. By 'separating out the needy' social assistance 'almost always stamps them out as socially inferior, as 'others' with other types of social characteristics and needs' (Rothstein, 1998: 158). To top it all off, it is likely that recipients of social assistance will not reciprocate financially over their life course (Larsen, 2008).

By contrast, spending on old age pensions consistently receives the highest levels of public support. Recipients are not seen as having control of their need for benefits, they are likely to have reciprocated financially over the course of their working lives, and, since most people envisage reaching old age, social affinity with this group of benefit recipients is high – pensioners are part of 'us' (Larsen, 2008).

The insights of the 'deservingness' literature reinforce the classic, interest-based institutionalist logic. Just as average earners and the rich will be less opposed to greater tax progressivity if the benefits provided are likely to accrue to them, they will also be less opposed if the benefits provided go to people who they perceive deserve them. In essence, this means that for average earners and the rich, benefits geared towards insurance will be worth funding, and benefits geared towards redistribution will be less so.

2.3 Giving with one hand, taking with the other

An inverse relationship between 'pro-poor' benefit spending and public support for more progressive taxation would fit with the surprising macro-level observation that countries with large, redistributive welfare states tend to be financed by less progressive tax systems (Prasad and Deng, 2009, OECD, 2008).

Existing explanations of this surprising macro-level pattern point to how the financing needs of large, redistributive welfare states are so onerous, that it is politically impossible to cover them solely through progressive forms of taxation. In line with recent scholarship that highlights

the historical roles of electoral rules and inter-sectoral elite cleavages (Mares and Queralt, 2015), war (Scheve and Stasavage, 2010, Scheve and Stasavage, 2016), and the structure of decision-making institutions (Steinmo, 1993) in shaping present-day tax systems, Kato (2003) argues that key characteristics of contemporary tax structures precede the development of modern welfare states. According to Kato, large, redistributive welfare states could only develop and be maintained in countries that had introduced substantial regressive indirect consumption taxes (such as the value added tax). Such taxes are highly effective in raising revenue, so they allow states to spend more generously on welfare programs.

Recent work has qualified and questioned the causal direction of Kato's argument (Ganghof, 2006a, Beramendi and Rueda, 2007). According to Ganghof, it is the need for increased public expenditures that pushes governments to increase tax revenue and not the other way around. Because capital taxation is both electorally and economically costly, generous welfare states tend to be financed heavily through regressive consumption and payroll taxes. Crucially however, they may also be financed through income taxes that offer substantial exemptions for capital income. In this way it is also possible to finance generous welfare states while relying heavily on progressive income taxation (Ganghof, 2007, Ganghof, 2006a: 370)[1].

For Beramendi and Rueda, a commitment to financing generous welfare states can push governments to rely more heavily on regressive taxation (Beramendi and Rueda, 2007). Their argument differs however in notable ways from that of Ganghof (2006). Focusing only on indirect (consumption) taxes, Beramendi and Rueda show that recourse to regressive taxation to fund generous redistributive social expenditure is not inevitable, but rather contingent on institutionalized corporatist commitments that limit the tax burden on capital. In corporatist countries where capital commits to stable investment in return for not being heavily taxed, Social Democratic governments are forced to finance redistributive social expenditure by taxing labour more heavily, and tend to rely on indirect taxes. In the absence of corporatist commitments, Social Democratic governments are free to tax capital more heavily to finance the welfare state (Beramendi and Rueda, 2007: 627, 632).

A common theme of the aforementioned explanations for the association between large, redistributive welfare states and less progressive tax systems is the difficulty governments face when trying to raise large sums through the taxation of capital. For economic, administrative, and political reasons, capital income is relatively costly to tax (Ganghof, 2006b). Generous welfare states must therefore be funded by regressive taxes that fall heavily on wages rather than capital, such as indirect taxes on consumption (Kato, 2003, Beramendi and Rueda, 2007), and income taxes that moderate capital taxation through extensive exemptions (Ganghof, 2006a). Yet, an inverse relationship between 'pro-poor' benefit spending and public support for more

[1] E.g. through the "dual income tax" employed in several Nordic countries which can offer substantial exemptions for capital income and vary the degree to which normal and above-normal incomes are taxed (Ganghof, 2006: 362).

progressive taxation suggests a deeper tension between redistribution through the benefit system and redistribution through the tax system. In countries with pro-poor benefit spending, progressive financing of the welfare state may be limited not only by the costs of taxing capital, but also by a lack of public support for more progressive taxation in general. Institutional constraints on progressive taxation may take the form not only of corporatist commitments as Beramendi and Rueda (2007) show, but also of pro-poor welfare state structures.

2.4 It's the inequality, stupid

It is possible that welfare structure affects preferences for tax progressivity indirectly, through the effect that it has on the post-tax and transfer distribution of income. In other words, tax preferences may be based not on 'who gets what' from welfare spending, but rather on the combination of 'who gets what *and* who pays for what' (Beramendi and Rehm, 2016), or 'who gets what, who pays for what, *and* who starts with what' (disposable income inequality) (Finseraas, 2008). It may even be that redistribution preferences more generally - and support for progressive taxation in particular – are not shaped by the welfare state at all, but rather by market income inequality (Meltzer and Richard, 1981, Lupu and Pontusson, 2011). There is a large and influential literature in political economy to this effect.

In the classic model of Romer (1975), formalized by Meltzer and Richard (1981), demand for redistribution increases in contexts of growing market income inequality. The model predicts that individual preferences for redistribution decline with income, but those at or below median income are more likely to demand redistribution the higher the level of market income inequality. As mean market income grows in relation to median market income, the median voter - and every voter with lower market income than the median voter - will increasingly support redistribution. Disposable income inequality should have the same effect, and may even be more relevant to redistribution preferences than market income inequality, since post-tax-and-transfer inequalities are likely to be more closely related to perceived inequality than pre-tax-and-transfer inequalities (Finseraas, 2008, Gimplelson and Treisman, 2015).

The Romer-Meltzer-Richard model (hereafter RMR) has been highly influential (see for example Cusack et al., 2006: 376), and has received empirical support at the micro-level (Finseraas, 2008, Kerr, 2014). At the same time, there have been substantial conflicting findings (Kenworthy and McCall, 2008, Lübker, 2007, Luttig, 2013, Kelly and Enns, 2010, Georgiadis and Manning, 2012), and recent work has gone some way towards qualifying the expectation that inequality increases support for redistribution.

Using cross-national data, Lupu and Pontusson (2011) show that if the structure of rising inequality is such that it brings the middle class economically closer to the poor relative to

the rich, the middle class will be more supportive of redistribution. If however rising inequality instead increases the distance between the middle class and the poor, the middle class increasingly oppose redistribution. According to Lupu and Pontusson, this is because economic distance undermines the social affinity between the middle classes and the poor (Lupu and Pontusson, 2011, see also Kristov et al., 1992, Shayo, 2009)[4].

In addition, substantial cross-national evidence suggests that, contrary to the predictions of both the Lupu-Pontusson model and the RMR model, inequality (both market and disposable) may in fact be associated with *greater* support for redistribution among the rich (Finseraas, 2008, Rueda and Stegmueller, 2015a, Rueda and Stegmueller, 2015b). Other-regarding preferences may go some way towards explaining this phenomenon (Dimick et al., 2016). And self-interest also plays a role - the rich in unequal countries may support redistribution due to fear of externalities of inequality, such as social instability (Alesina and Perotti, 1996) or crime (Rueda and Stegmueller, 2015a), or because they perceive the deadweight losses of redistribution to be lower than the rich in more equal countries (Finseraas, 2008).

2.5 Hypotheses

In sum then, despite relatively little scholarly work on the institutional determinants of tax progressivity preferences, a rich literature on redistribution preferences suggests that individuals may take the distribution of benefits into account when forming preferences about who should bear the burden of paying for them. Building on institutionalist arguments that progressive welfare states erode the insurance motive for supporting welfare state spending as well as the perceived fairness of such spending, we expect that welfare states where benefits are pro-poor will undermine support for tax progressivity, among both average and high income earners.

> **H1:** The more pro-poor the structure of welfare state spending, the lower the support for more progressive taxation.
>
> **H2:** The more pro-poor the structure of welfare state spending, the lower the support for more progressive taxation among high-income earners.

In recognition of influential research highlighting the role of inequality on redistribution preferences (Meltzer and Richard, 1981, Lupu and Pontusson, 2011, Finseraas, 2008, Moene and Wallerstein, 2001), we are open to the possibility that it may be not be the distribution of benefits *per se*, but rather the resulting distribution of disposable income, that shapes support for progressivity on the revenue side of the welfare state. In other words, we anticipate that we may find support for our hypotheses not because the distribution of benefits matters in itself, but because it reduces disposable income inequality, which in turn reduces support for redistribution

among average earners. In the empirical analysis that follows therefore, we are careful to include disposable income inequality.

3. WELFARE STATE STRUCTURE, INEQUALITY, AND SUPPORT FOR PROGRESSIVE TAXATION IN COMPARATIVE PERSPECTIVE

Studying taxation preferences from a cross-country perspective is limited by a paucity of questions on this topic in cross-nationally comparative standardized surveys. The ISSP Role of Government module IV for 2006 contains information on taxation preferences for a set of high-income countries.[5] The timing of the survey allows us to test our argument during a period of relative economic stability. In this way we ensure that we draw our inferences from a sample of individuals whose policy preferences have not yet become unsettled (in ways that have yet to be theorized) by the widespread macroeconomic uncertainty generated by the financial crisis of 2007-2008.

We use a mixed model with random intercept since observations are clustered in countries (Steenbergen and Jones, 2002). After studying the general effect of welfare state progressivity on attitudes towards tax progressivity, we add cross-level interaction terms between individual income and pro-poor benefit spending. Informed by recent scholarship on the limitations of multilevel level modeling with few observations at level two (Van der Meer et al. 2010; Stegmueller 2013; Bryan and Jenkins 2016) we apply a set of robustness tests discussed below.

3. 1 Empirical strategy and operationalization

To study taxation preferences as our dependent variable we use the ISSP question: "how would you describe taxes […] today? We mean all taxes together, including [wage deductions], [income tax], [taxes on goods and services] and all the rest". The respondent is encouraged to answer the question with regard to taxes on those with high incomes (12a), middle incomes (12b) and low incomes (12c), with the categories "much too high", "too high" (both coded as too high **H**), "about right" (coded as about right **R**), "too low" and "much too low" (both coded as too low **L**).[6] We follow Barnes (2015: 10) in creating a dummy variable for *support for progressive taxation* based on these three items and the simplified three answer categories too high H, about right R, and too low L, which gives us a set of 27 possible combinations. Respondents are coded as supportive of more progressive taxation (=1) when they choose one of the following combinations for taxes on high, middle and low incomes: LHH, LRH, RHH, RRH, LRR, LLH and LLR. All other combinations are coded as 0, meaning support for less progressive taxation.[7]

Our key independent variables are income, measured as relative household income by country in the ISSP, and macro level information on welfare state structure. The ISSP gathers information on household income before taxes and transfers in absolute values, so we calculate a relative income measure based on the country's average. The relative household income measure is weighted by household size, and we create a dummy variable for the top 10% share of the household income distribution in each country to test how high-income households respond to different welfare state structures.[8] Information on personal income is also available, though with a lower response rate. We use household income on the basis that the total available income within the household plays a more crucial role in determining individual tax attitudes than the personal income of household members (see Häusermann et al., 2016).[9]

We construct our main indicator of welfare state structure using data from the OECD's Social Expenditure (SOCX) database. The SOCX database classifies social expenditure in 9 categories: old age, survivors, incapacity, health, family, ALMP, unemployment, housing and 'other', which includes social assistance to both the working age population and the elderly (OECD, 2016). Building on the institutionalist literature discussed above, we identify four categories of social spending that should undermine support for tax progressivity among average and high-income earners, because they favor the poor by performing predominantly redistributive rather than insurance functions (Moene and Wallerstein, 2001) and cater for benefit recipients that are typically considered to be less deserving (Larsen, 2008, Oorschot, 2006). These 'progressive' spending categories are summed and expressed as a share of total social expenditure to yield a *ratio of benefit progressivity*. Higher values proxy more 'pro-poor' social spending, that is more loosely based on reciprocity and with a tendency to benefit less 'deserving' recipients. Lower values proxy welfare states where expenditure is geared more towards insurance against loss of income, benefiting higher income earners and more 'deserving' recipients.[10]

Most straightforwardly, we expect social expenditure in the *'other'* category to undermine support for tax progressivity among average and high-income earners, since it is largely composed of social assistance benefits (Korpi and Palme, 1998, Moene and Wallerstein, 2001, Oorschot, 2006). We also follow Moene and Wallerstein in expecting that *family* and *housing* benefits perform predominantly redistributive rather than insurance functions, and therefore class these expenditure categories too as 'pro-poor'. By the same logic, *survivors*, *incapacity*, and *unemployment* benefits are excluded from the 'pro-poor' category (see Moene and Wallerstein, 2001: 867). However, while Moene and Wallerstein include *ALMPs* as insurance expenditure, we class this category of spending as pro-poor since - notwithstanding the many forms it takes – as a whole it primarily benefits labour market 'outsiders' (Rueda, 2007, Vlandas, 2013). Conversely, while we recognize that pension systems perform both 'piggy bank' and redistributive functions (Barr, 2006), we class *old age* benefits as insurance rather than redistributive. This is unlike Moene and Wallerstein, who exclude old age spending from insurance expenditure on the grounds that

'loss of income on retirement is an expected event' (2001: 867). In our framework, if a benefit insures against loss of income from an 'expected' event, it is more likely to foster support for tax progressivity because perceptions of control and 'otherness' that delegitimize spending are directly reduced. Finally, we include data on *health* spending, which we class as insurance rather than pro-poor on the same logic as that for pension spending. Our *ratio of benefit progressivity* is therefore composed of spending on 'housing', 'family', 'ALMPs', and 'other', as a share of total social spending. While we expect individuals to be influenced in their tax preferences by the policy bundle instead of single expenditure categories, as a robustness test we look at each of these spending categories as share of total social expenditures separately, to rule out that one particular category is driving the effect.[11]

As an additional measure of welfare state structure, we use the OECD's *concentration coefficient of cash transfers* (calculated for 2006). This indicator is a summary measure of how benefits are distributed among income groups, or otherwise, of 'who gains' from cash transfers. It is often used as a proxy of how targeted benefits are on the poor (Korpi and Palme, 1998, Marx et al., 2016), although strictly speaking the indicator cannot be used to infer the extent to which benefits are means-tested. More accurately, it is a measure of the progressivity or 'pro-poorness' of welfare expenditure – of outcomes rather than of welfare state structure (Marx et al., 2016). The concentration coefficient for cash transfers is zero when everyone receives the same transfer (e.g. when benefits are flat rate), negative when the poor receive more in absolute terms than the rich (e.g. when benefits are means-tested), and positive when the rich receive more in absolute terms (e.g. when benefits are earnings-related) (Bloch et al., 2012). In general, the concentration coefficient of transfers is negative where poorer income groups receive a higher share of transfers than their share of disposable income – lower and more negative values imply greater progressivity. In our sample, the distribution of cash benefits for the entire population is most progressive, by a wide margin, in Australia, followed by New Zealand, Denmark, the United Kingdom, and Finland, while it is least progressive in Portugal and Poland (OECD, 2008).

3. 2 Control Variables

We add a set of standard control variables drawing on Barnes (2015), Heinemann and Hennighausen (2015), and Roosma et al. (2015), namely gender (female), age, age squared (to take into account nonlinearities of the age effect), education, and employment status (part time employed, student, unemployed, retired, housekeeping; employed serves as reference category)[12]. Older respondents and those with stable employment are less likely to support more progressive taxation, while the unemployed and younger individuals have a clear incentive to support greater tax progressivity. In addition, following Barnes (2015) and Rehm (2009), we include information on occupation-specific unemployment risk, measured using ISCO88 occupation codes and

occupational unemployment data from the ILO (2016).[13] Occupational unemployment risk should increase support for more progressive taxation for the average individual.

In a further model specification (Table 2), we take attitudinal variables into account (see Barnes 2015; Heinemann and Hennighausen 2015; Roosma et al. 2015). We include an item measuring the individual's political affiliation on a five-point scale (only as a robustness check, due to concerns of endogeneity with taxation preferences). We recode the item so that 1-2 indicates a left ideology, 3 a center position, 4-5 a right-wing ideology and 6 identifies individuals who are indifferent (indifference serves as the reference category). Additionally, we control for individual religiosity, on the grounds that the associated principle of subsidiarity is likely to undermine support for tax progressivity (see Scheve and Stasavage, 2016, De La O and Rodden, 2008). Finally, we add a control for social trust, since the belief that others are likely to free-ride by evading taxes should decrease support for more progressive taxation. The item measuring social trust asks how far the respondent supports the statement (on a five point scale from strong agreement to strongly disagreement) that there are "only a few people that I can trust completely". Higher values reflect greater social trust.

At the macro level we add indicators of income inequality, informed by influential political economy arguments that redistribution preferences are shaped by market income inequality (Meltzer and Richard, 1981, Lupu and Pontusson, 2011), and to control for the possibility that that pro-poor welfare spending affects preferences for tax progressivity through its effect on disposable income. We use data from Solt (2009, version 4) to measure both market inequality and net (post-tax and transfer) income inequality. Additionally, we use post-tax and transfer income ratios (P90/P10, P90/P50) to capture the difference between the 90th and the 10th, and the 90th and the 50th (see Table S4 in the supplementary material), percentiles of each country's income distribution (top-to-bottom inequality/top-to-middle inequality), provided by the OECD (2016) to consider the argument of social affinity in the sensitivity analysis.[14]

There is some overlap between the information captured by post-tax and transfer inequality measures and the information captured by our benefit progressivity indicators - post-tax and transfer inequality is of course affected by the progressivity of welfare state benefits. Although not fully independent, the two sets of indicators are however conceptually distinct. While the benefit progressivity indicators proxy only who gains from social spending, indicators of post-tax and transfer inequality capture not only this, but also the market distribution of income, the level of social expenditure, and the progressivity and level of taxation.

Finally, we add three macro-level controls. Since our dependent variable is formed by asking respondents whether taxes on different groups are currently too high, too low, or about right, we control for the existing progressivity of the tax system using data from the OECD (2008) on the share of taxes on the 10th decile of the income distribution.[15] To help us exclude

the possibility that demand for more progressive taxation declines with redistributive effort (as per a "satisfaction effect" discussed in section 4.1 below) we also use OECD SOCX data to control for the total level of welfare expenditure. Lastly we control for the homicide rate - a broadly available and cross-nationally comparable measure of criminal activity provided by the World Bank (2016) – to proxy for negative externalities of inequality that recent research suggests can increase support for redistribution (Rueda and Stegmueller, 2015a, see also Skogan 1986). Since degrees of freedom at level two are limited, we add no further macro control variables (for a discussion see Stegmueller, 2013).

3. 3 Model Specification

Since our dependent variable *support for progressive taxation* is dichotomous we apply a logistic hierarchical varying-intercept regression model. We estimate the intra-class correlation coefficient (see Snijders and Bosker, 2012) to explore how much variance of the DV is explained by level two. Approximately 9.46% of the variation in progressive taxation support is induced by differences between countries, substantiating the need for a mixed model. The intercept is not constrained and varies by country. Following Gelman and Hill (2007) we specify the model for i=1…N individuals and j=1…N countries as follows:

$$\Pr(y_i = 1) = \text{logit}^{-1}(\alpha_j + \beta_1 \text{ household income}_i + \beta_2 X_i)$$

$$\alpha_j \sim N(\gamma^{\alpha}_{0} + \gamma^{\alpha}_{1} \text{ welfare state progressivity}_j + \gamma^{\alpha}_{2} U_j ; \sigma^2_{\alpha})$$

X describes a vector of individual level and U a vector of macro level control variables. We add a cross-level interaction term between individual income and welfare state structure to the equation (top 10% household income$_i$ × welfare state progressivity$_j$) to test if the share of pro-poor welfare expenditures moderates the effect of relative household income on preferences for tax progressivity. The likelihood ratio test confirms that adding the cross-level interaction term increases the explanatory power of the model.

Care needs to be taken when drawing inferences from small-N multilevel regressions, since especially the estimates at level two are vulnerable to bias (see Van der Meer et al. 2010; Stegmueller 2013; Bryan and Jenkins 2016). The findings can be sensitive to the countries included in the sample and the timing of the survey. With this in mind, we apply and discuss a set of robustness tests in the form of different model specifications, tests for influential cases, and bootstrapping. Nevertheless, we remain cautious in the interpretation of our empirical findings.

4. RESULTS

4.1 Support for progressive taxation and welfare state structure

In Table 1 we report the effects of progressive welfare spending as a share of social spending (Model 1) and the concentration coefficient (Model 2) on preferences for progressive taxation. Subsequently, following the logic of a step-wise procedure we add different controls for income inequality (Models 3 to 6). As discussed, our ratio of benefit progressivity captures the importance of pro-poor welfare spending relative to other forms of welfare spending. Higher values reflect relatively higher spending on pro-poor welfare categories. By constrast, higher values of the concentration coefficent reflect a less progressive system of cash benefits.

We find that the more effort a government devotes to pro-poor welfare categories the lower the average support for a more progressive tax system (Model 1). To illustrate the effect we plot the predicted probabilities with 95% confidence intervals in Figure 1 for (a) the ratio of benefit progressivity and (b) the concentration coefficient. The rug plot below indicates the distribution of the context variables in our sample. The likelihood of support for progressive taxation of the average individual steeply declines the higher the share of social spending devoted to progressive welfare programs such as social assistance, family allowances, housing or ALMPS.[16] The incidence rate for the DV declines from above 80% to below 50%. The effect is similar when we use the concentration coefficient instead (see Model 2, Model 4 and Model 6). The likelihood of supporting greater tax progressivity increases the less concentrated cash transfers are on the poor (see panel b, Fig. 1). Our first hypothesis finds empirical support.

**** Table 1 ****

**** Figure 1 ****

One could argue that support for progressive taxation decreases with benefit progressivity due to a 'satisfaction effect' - the more the poor are 'taken care of' the less important it is to redistribute or raise further revenue through more progressive taxation. This is a very different logic to being opposed to more progressive taxation because the benefits it finances accrue to the poor. We disentangle these two possible interpretations of our findings by taking into account the existing level of welfare expenditures (Table 1 and 2), measured by total per capita social expenditures from the SOCX OECD dataset.[17] Adding this control for the level of welfare expenditures does not substantively change our results. The coefficient for the progressivity ratio remains highly significant and negative, and the concentration coefficient also remains robust. It is the structure rather than the level of social expenditures that affects support for progressive taxation. In an

additional effort to ensure we correctly interpret our results, we assume that other things equal, a politically left respondent is less likely to be 'satisfied' by the existing level of redistribution than a right-wing respondent. We hold constant how left-wing the individual is and still find a significant negative effect for our benefit progressivity ratio (Table 2 M7-M8).

Our findings remain robust after controlling for the respondent's perception of the level of taxation and the existing progressivity of taxation (Table 2 M9-M12) - we still find a negative effect of pro-poor spending on individual support for progressive taxation. The tax measures themselves do not exert a robust significant impact on tax preferences, in line with the recent findings of Sumino (2015).[18]

**** Table 2 ****

Against the RMR logic, income inequality does not exert an effect on attitudes toward progressive taxation (or only marginally in M4, and in this case it is market inequality).[19] Without our welfare progressivity measures, income inequality exerts a significant impact on support for more progressive taxation (estimates are not displayed). But when we control for pro-poor expenditures as share of overall social expenditure, the effect turns insignificant. The ratio of benefit progressivity washes out the general effect of inequality.

Before we turn our attention to the tax progressivity preferences of high-income earners, we discuss some of the relevant control variables at the micro level. As expected, support for more progressive taxes decreases with rising household income. The effect is highly significant and robust to different specifications of the model with attitudinal controls such as religiosity, social trust and political ideology, as reported in Table 2. However, in contrast to Barnes (2015) we find a negative effect for education, meaning more educated individuals are less likely to support increased tax progressivity – education mirrors the income effect. Females are overall supportive of tax progression, and so are the unemployed and the retired. Especially the risk of unemployment increases the likelihood of being in favor of more progressive taxation, in line with previous findings from the literature.

4.2 High-income households and progressive welfare state structure

We now move to the analysis of cross-level interactions between household income and welfare state structure. As discussed above, we expect higher-income earners to be more opposed to greater tax progressivity the more benefits are pro-poor. We therefore interact the dummy variable for the top 10% of household income with the benefit progressivity ratio. Table 2 reports estimation results for logistic hierarchical regressions.

**** Table 3 ****

Figure 2 (a) and (b) illustrates the interaction term (95% confidence intervals) with an average marginal effects plot for top 10% of household income and the benefit progressivity ratio (a) and the concentration coefficient (b). We see in Fig. 2a that the average marginal effect of top 10% household income is negative and significant. High-income households are more likely to oppose greater tax progressivity the more pro-poor welfare spending is, holding income inequality constant. Fig 2b shows that opposition to more progressive taxation shrinks among high income earners when cash transfers are less concentrated on the poor (Fig. 2b).

However, the confidence intervals overlap at many levels for both macro variables, such that high-income households in a country which spends 20% percent of social expenditures on pro-poor categories do not have a higher or lower likelihood of opposing more progressive taxation than high-income housholds in a country with a benefit progressivity ratio of 25%. However, high-income households in countries that have a very low share of progressive welfare expenditures, around 10%, are less likely to oppose greater tax progressivity than similar households in countries that spend around 25% of the welfare budget on pro-poor programs. The effect is less decisive for the concentration coefficient in terms of significance, but the pattern follows the same logic. We therefore report tentative support for the hypothesis that the rich are less willing to accept a higher burden of taxation in more pro-poor welfare states.

**** Figure 2 ****

We need to interpret our findings with caution since they are based on only 21 country-cases. Informed by recent scholarship on multilevel models that are limited by a small N at level two (see Van der Meer et al., 2010, Bryan and Jenkins, 2016, Stegmueller, 2013), we apply a test of DFBETAS following Van der Meer et al. (2010). This allows us to determine the influence of individual country cases on particular estimates, as well as the extent to which groups of countries drive our results. The visual analysis of the distribution of the progressive benefit spending ratio in Figure B offers an initial indication that New Zealand might be an influential case which pulls the estimates downward, and this is confirmed by the analysis of the variance of the random intercepts (see Figure S2 in the supplementary material). The coefficients for the progressive benefit spending ratio and the concentration coefficient remain robust when excluding New Zealand from the sample, and also when excluding NZL, KOR and JPN, a group indicated as influential by the DFBETAS test (see Table S7 in the supplementary material).[20]

As an additional test, we employ bootstrapping to receive robust standard errors. The coefficient for our welfare progressivity ratio remains robust with the corrected standard errors following from 999 repetitions on random draws from the sample (coefficient: -0.067 and bootstrapped std. error: 0.012, see Table S9 in the supplement). While the confidence with which we interpret our findings is therefore inherently constrained by the data limitations we face, we are heartened by the robustness and coherence of our results in the face of these additional estimations, and satisfied that our results are not driven by a few countries.

5. CONCLUSION

In this paper, we set out to analyze the relationship between welfare state structure and public attitudes towards progressive taxation. While the idea that public attitudes towards taxation and redistribution depend on the structure of welfare state entitlements is well established in comparative politics (Moene and Wallerstein, 2001, Korpi and Palme, 1998, Esping-Andersen, 1990), recent research on the determinants of tax preferences has not been able to make sense of cross-country variation by appealing to welfare state type (Roosma et al., 2015, Barnes, 2015).

By choosing welfare state indicators that closely proxy the progressivity of social expenditures, we discern a substantial impact of the welfare state on attitudes towards progressive taxation. Our cross-sectional findings show that the progressivity of social expenditure is strongly associated with weaker support for more progressive taxation. The average income household is less supportive of greater tax progressivity in countries with pro-poor benefit systems than in countries where programs that insure against middle-class risks make up a relatively larger part of social expenditure. We also find high-income households to be less sympathetic towards progressive taxation where benefit spending is more pro-poor, though we are more cautious about the significance of these results.

These findings are in line with our theoretical expectations. Informed by a rich institutionalist literature on redistribution preferences, we expected the public to take the distribution of benefits into account when forming preferences about who should bear the burden of paying for them. Specifically, we expected average earners and the rich to be more sympathetic towards progressive taxation in welfare states where benefits are less targeted to the poor. This is because in such welfare state contexts, the benefits financed from taxation are more likely to accrue to average earners and the rich themselves, or to people otherwise perceived as deserving recipients.

Of course, the structure of welfare benefits has direct implications for inequality. Other things equal, the more progressive are social expenditures, the lower disposable income inequality will be. Nonetheless, the impact of the structure of social expenditure on tax preferences is an

independent one, robust to controls for disposable income inequality. We see an independent effect of welfare state structure on the tax progressivity preferences of average-income households, and of households in the top decile of the income distribution. When controlling for inequality, the rich are less likely to strongly oppose progressive taxation in welfare states where they benefit more from social expenditure than in more pro-poor welfare states. We are therefore confident that it is the distribution of benefits *per se*, rather than the resulting distribution of disposable income, that shapes support for progressivity on the revenue side of the welfare state.

By linking 'pro-poor' welfare spending to lower public support for tax progressivity, our findings contribute to recent work explaining the surprising macro-level phenomenon that larger, more redistributive welfare states tend to be financed by less progressive tax systems. Existing explanations center on the financing needs of large, redistributive welfare states. These needs are seen as so onerous that it is difficult to cover them by relying solely on progressive forms of taxation that burden capital. As a result, they tend to be financed through typically regressive indirect taxes (Kato, 2003, Beramendi and Rueda, 2007), and income taxes that offer significant capital exemptions (Ganghof, 2006a). But an inverse relationship between 'pro-poor' benefit spending and public support for more progressive taxation suggests a deeper tension between redistribution through the benefit system and redistribution through the tax system. In countries with pro-poor benefit spending, progressive financing of the welfare state may be limited not only by the costs of taxing capital, but also by a lack of public support for more progressive taxation in general. This makes us less confident than Beramendi and Rueda (2007: 641) that 'the cloud of weakening corporatism comes with a silver lining' – even free of their corporatist commitments to capital, social democratic governments may struggle to finance redistributive social spending through more progressive taxation.

We do not of course intend to imply that increased redistribution is politically impossible. For one thing, we do not claim that the redistributive effect of pro-poor social spending is cancelled out by lower public support for progressive taxation. Indeed, such a claim would involve making a number of logical leaps, not least assuming that tax policy can be straightforwardly 'read-off' from individual tax preferences. Moreover, mature welfare states achieve redistribution in large part through high levels of social expenditure, while the relative contribution of pro-poor benefit targeting to redistribution is small (Guillaud et al., 2017). At a time when further increases in levels of taxation and social spending are widely unpopular however (Barnes, 2015), and given the strong impact that progressive taxation can have on redistributive outcomes (Guillaud et al., 2017), future scholarship seeking to explain patterns of redistribution may find it fruitful to join us in working towards understanding the political feasibility of greater tax progressivity.

Appendix

**** Figure A ****

**** Figure B ****

**** Table A ****

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[1] Where support for progressive taxation is measured as described in section three below.

[2] By contrast, if welfare benefits were to accrue mainly to the poor, efficiency arguments (see Stiglitz, 1987) might start coming into play - average earners might start questioning whether helping 'the poor' is worth any disincentive effects and growth consequences that higher marginal tax rates might entail.

[3] A small literature from economics links low benefit morale (i.e. the tendency to exploit the welfare state via benefit fraud) with high levels of social expenditure (Lindbeck, 1995; Halla et al., 2010; Heinemann, 2008). To the extent that individuals are aware of prevailing levels of benefit morale, the perceived deservingness of benefit recipients may be affected by the size as well as the structure of the welfare state.

[4] Social affinity consists in part of economic self-interest, reflecting the assumption that the probability of moving between any two positions in the income distribution is higher when the distance between the two positions is smaller. In addition, the concept of social affinity encompasses altruism. Middle-income voters empathize with the poor when they perceive them to lives similar to their own (Lupu and Pontusson 2011). We take this reasoning into account in our robustness tests.

[5] The ISSP 2006 Role of Government survey covers 33 OECD countries. For comparability, we focus our analysis on high-income democracies, though we choose not to exclude four strictly speaking middle-income Eastern European countries (Croatia, Hungary, Latvia and Poland) that are more similar to the rest of the high-income OECD countries in terms of culture and historical development (for a discussion see Dion and Birchfield 2010). Of the remaining 27 countries, 7 drop out of our main analyses because of data limitations. In particular: 3 countries (TWN, HRV, RUS) drop out due to missing SOCX data on our two welfare state progressivity measures (our central explanatory variables); 3 further countries (IRL, FRA and NLD) drop out because of missing data on unemployment risk (control variable); LVA drops out because of missing data on P90/P10 (control variable). We therefore conduct our main analyses for the following sample: AUS, CAN, CZE, DNK, FIN, DEU, HUN, ISR, JPN, KOR, NZL, NOR, POL, PRT, SVN, ESP, SWE, CHE, GBR, and USA (N = 20 at level two). We include LVA in the models that do not contain the control for P90/P10 (N=21), and additionally provide the interested reader with estimation results limited only by missing SOCX data on benefit progressivity (table S6 and figure S1 in the supplementary material file). By removing our scope conditions and excluding the control variables "unemployment risk" and "P90/P10", we can include NLD, IRL, FRA, LVA and CHL in our analysis (N=25). The coefficients for our main variables of interest remain robust and substantively unchanged.

[6] Individuals who respond 'can't choose' are excluded from the sample.

[7] We illustrate the distribution of the DV across countries in Figure A (Appendix).

[8] Cognizant of the arbitrary nature of the top 10% cut-off point, we vary the threshold (top 1%, top 5% and top 25%) and report the results in Table S2 of the supplementary material. The effect is similar for the top 5% and top 25%. We do not find a significant effect for the top 1%, possibly due to the low number of observations. We also add an interaction term for the lowest 25% of the household income distribution in Table S3. In contrast to high income households, the poor are even more supportive of progressive taxation where the welfare state structure is more progressive.

[9] We report in Table S3 (supplementary material) findings for the top 10% of the country's distribution on *personal* income, which show a similar pattern but no significant effect.

[10] Figure B displays the progressive welfare spending ratio in a bivariate correlation plot with 95% confidence intervals for aggregated support for progressive taxation.

[11] Results are reported in Table S1 (supplementary material).

[12] We do not control for skill specificity, following Barnes (2015) who found no effect for this when using ISSP 2006 data to analyze taxation preferences.

[13] We calculate the occupational unemployment rate following the estimation procedure of Rehm (2009).

[14] The OECD (2016) defines the measures as follows: 'P90/P10 is the ratio of the upper bound value of the ninth decile (i.e. the 10% of people with highest income) to that of the first decile'. Income consists of 'earnings, self-employment and capital income and public cash transfers; income taxes and social security contributions paid by households are deducted'.

[15] We also conduct three related robustness tests. We control for tax progressivity using a tax concentration coefficient from the OECD (which reduces the sample at level two to 15 cases). We control for the respondent's perception of the level of taxation, a continuous variable based on the combined respondent's statements that taxes on the poor, middle and rich are too high (as in Barnes 2015). And we control for the level of taxation using the Heritage Foundation's indicator of 'fiscal freedom', higher values of

which indicate a lower tax burden (see Table S4 and S5 in the supplementary material). While the taxation measures do not show robust effects, our main effects remain substantially unchanged.

[16] Disaggregating 'pro-poor' expenditure, we find that our results are not driven by one expenditure category (Table S1). Moreover, in line with our theoretical expectations, the expenditure categories doing the most 'work' in our model (family and housing) have (on average in the OECD) the first and third lowest concentration coefficients of all expenditure categories. Interestingly, the 'other' category, which has the second lowest concentration coefficient of all expenditure categories, is not significant in our model (OECD, 2008: 105-106), but the sign of the coefficient is in the expected direction.

[17] The correlation between our progressive welfare spending ratio and the level of per capita welfare expenditures is positive but low (0.28) so that we can add both variables without running the risk of a multicollinearity bias in the model specification. Without the progressivity ratio per capita social spending receives a negative but insignificant coefficient (estimation not displayed).

[18] Sumino develops the argument that the level of direct taxation amplifies the effect of income on support for progressive taxation, because it affects the visibility of taxation. The higher the level of direct taxation, the higher its visibility and therefore the greater the polarization of tax progressivity preferences between the rich and the poor. With visibility key to why tax levels matter, it is therefore not surprising that we find our measure of individual *perceptions* of the level of taxation to exert no significant effect on preferences for tax progressivity. Visibility is also likely to be key to explaining the absence of a significant impact exerted by existing tax progressivity on support for tax progressivity. This lack of impact - which also finds support in Sumino (2015) - could be seen as surprising. Surely respondents should be sensitive to the existing progressivity of the tax system when asked to express their tax preferences relative to the status quo. Yet a large and diverse body of literature has documented the difficulties mass publics face in accurately perceiving the progressivity of the existing tax system (see for example Howard, 1999; Mettler, 2011; Buchanan, 1967; Bartels, 2005).

[19] Neither top-to-bottom inequality, nor top-to-middle inequality where we would mostly expect to see an effect following Lupu and Pontusson (2011), shows a significant impact on support for progressive taxation (see Table 1, and Table S4 in the supplementary material). Moreover, we do not find any evidence that the homicide rate increases support for more progressive taxation, and our findings remain robust to the inclusion of this control (see Table S4). It might be the case that the homicide rate indicator is too aggregated to capture the negative externalities of inequality, but we lack information about fear of crime at the individual level for the ISSP.

[20] Only NZL and JPN are strictly outside the interval of the DFBETA test. Since KOR is outside the whiskers within the interval, we also exclude it to be conservative. Findings of the DFBETAs analysis are reported in the supplementary material (Table S8).

Table 1: Logistic hierarchical regression: support for progressive taxation and progressive welfare state structure

	(M 1)	(M 2)	(M 3)	(M 4)	(M 5)	(M 6)
DV: progressive taxation						
Progressive welfare spending	-0.063***		-0.063***		-0.067***	
	(0.018)		(0.017)		(0.017)	
Concentration coefficient		0.027***		0.030***		0.029***
		(0.005)		(0.004)		(0.005)
Household income	-0.284***	-0.300***	-0.283***	-0.298***	-0.313***	-0.300***
	(0.026)	(0.028)	(0.026)	(0.028)	(0.027)	(0.028)
Micro controls						
Female	0.139***	0.141***	0.139***	0.142***	0.136***	0.140***
	(0.034)	(0.036)	(0.034)	(0.036)	(0.035)	(0.036)
Age	0.048***	0.047***	0.048***	0.047***	0.048***	0.047***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Age2	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.198***	-0.210***	-0.198***	-0.210***	-0.205***	-0.210***
	(0.037)	(0.039)	(0.037)	(0.039)	(0.037)	(0.039)
Employment status						
Part-time	-0.011	0.021	-0.012	0.020	-0.020	0.022
(Ref. Cat.: employed)	(0.056)	(0.059)	(0.056)	(0.059)	(0.057)	(0.059)
Unemployed	0.089	0.119	0.089	0.122	0.088	0.117
	(0.095)	(0.099)	(0.095)	(0.099)	(0.095)	(0.099)
Student	0.095	0.080	0.094	0.078	0.071	0.080
	(0.117)	(0.120)	(0.117)	(0.120)	(0.117)	(0.120)
Retired	0.107	0.117	0.108	0.121+	0.114	0.114
	(0.068)	(0.071)	(0.068)	(0.071)	(0.069)	(0.071)
Housekeeping	-0.073	-0.063	-0.073	-0.063	-0.076	-0.063
	(0.068)	(0.070)	(0.068)	(0.070)	(0.068)	(0.070)
Education	-0.072***	-0.065***	-0.073***	-0.067***	-0.068***	-0.065***
	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)	(0.014)
Unemployment risk	0.008*	0.008*	0.008*	0.008*	0.008*	0.008*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Macro controls						
Social spending per capita	-0.000	0.000	-0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Gini market			-0.016	-0.044**		
			(0.018)	(0.015)		
P90/P10					-0.163	-0.149

					(0.110)	(0.107)
Constant	1.125**	0.033	1.911*	2.022**	1.975**	0.794
	(0.372)	(0.295)	(0.941)	(0.723)	(0.738)	(0.614)
Random effects parameters						
Var (constant)	0.180**	0.112**	0.172**	0.073**	0.161**	0.101**
	(0.058)	(0.039)	(0.055)	(0.027)	(0.053)	(0.036)
N Level 1	17884	16267	17884	16267	17363	16267
N Level 2	21	18	21	18	20	18
ll	-10817.038	-9880.04	-10816.634	-9876.50	-10551.87	-9879.12
BIC	21790.7	19915.2	21799.7	19917.9	21269.7	19923.1

Note: Standard errors in parentheses. + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; For Korea we lack information on housing, so that the progressive welfare spending ratio for Korea only contains ALMP, family allowances and 'other'. The results remain robust when we exclude Korea. In M5 P90/P10 data is missing for LVA.The concentration coefficient is missing for SVN and ISR.

Source: ISSP 2006; ILO (2006); Solt (2009); OECD (2016).

Table 2: Robustness test: Satisfaction effect

	(M 7)	(M 8)	(M 9)	(M 10)	(M 11)	(M 12)
DV: progressive taxation						
Progressive welfare spending	-0.059**		-0.054***		-0.063***	
	(0.019)		(0.016)		(0.016)	
Concentration coefficient		0.026***		0.025***		0.027***
		(0.005)		(0.004)		(0.004)
Household income	-0.248***	-0.274***	-0.279***	-0.289***	-0.298***	-0.299***
	(0.028)	(0.029)	(0.027)	(0.028)	(0.028)	(0.028)
Micro controls						
Female	0.144***	0.134***	0.167***	0.169***	0.141***	0.141***
	(0.039)	(0.040)	(0.036)	(0.038)	(0.036)	(0.036)
Age	0.041***	0.041***	0.042***	0.042***	0.047***	0.047***
	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Age2	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.185***	-0.200***	-0.191***	-0.208***	-0.209***	-0.211***
	(0.042)	(0.043)	(0.039)	(0.040)	(0.039)	(0.039)
Employment status						
Part-time	0.004	0.005	-0.027	0.019	0.017	0.020
(Ref. Cat.: employed)	(0.063)	(0.064)	(0.059)	(0.062)	(0.059)	(0.059)
Unemployed	0.141	0.131	0.135	0.159	0.124	0.121
	(0.114)	(0.116)	(0.100)	(0.105)	(0.099)	(0.099)
Student	0.103	0.074	-0.122	-0.106	0.075	0.080
	(0.133)	(0.134)	(0.122)	(0.125)	(0.120)	(0.120)
Retired	0.056	0.072	0.084	0.097	0.120+	0.118+
	(0.076)	(0.078)	(0.072)	(0.075)	(0.071)	(0.071)
Housekeeping	-0.036	-0.022	-0.055	-0.029	-0.066	-0.061
	(0.075)	(0.076)	(0.071)	(0.074)	(0.070)	(0.070)
Education	-0.062***	-0.053***	-0.113***	-0.108***	-0.066***	-0.065***
	(0.015)	(0.016)	(0.014)	(0.015)	(0.014)	(0.014)
Unemployment risk	0.011**	0.010*	0.011**	0.011**	0.008*	0.008*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Political ideology						
Left	0.285***	0.300***				
(Ref. Cat.: no position)	(0.067)	(0.068)				
Center	-0.109	-0.125+				
	(0.073)	(0.075)				
Right	-0.456***	-0.459***				
	(0.066)	(0.067)				
Religious	-0.045*	-0.050*				

	(0.020)	(0.020)				
Social trust	0.013	0.015				
	(0.016)	(0.017)				
Taxes too high			-1.213***	-1.215***		
			(0.032)	(0.034)		
Macro predictors						
Social spending per capita	-0.000	-0.000	-0.000	0.000		
	(0.000)	(0.000)	(0.000)	(0.000)		
Taxes on the richest 10%					-0.032+	-0.031*
					(0.017)	(0.012)
Constant	1.302**	0.259	5.515***	4.445***	1.933**	1.112*
	(0.399)	(0.317)	(0.359)	(0.283)	(0.640)	(0.442)
Random effects parameters						
Var (constant)	0.192**	0.117**	0.136**	0.062**	0.156	0.082
	(0.063)	(0.042)	(0.044)	(0.023)	(0.054)	(0.029)
N Level 1	14278	13545	17884	16267	16267	16267
N Level 2	20	18	21	18	18	18
ll	-8514.977	-8150.359	-10009.609	-9136.411	-9883.512	-9878.042
BIC	17230.9	16500.5	20185.7	18437.7	19922.2	19911.2

Note: Standard errors in parentheses. + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; Political ideology is missing for ISR and the concentration coefficient is missing for SVN and ISR.

Source: ISSP 2006; ILO (2016); OECD (2016).

Table 3: Logistic hierarchical regression: Support for progressive taxation, welfare state structure and high-income households

	(M 13)	(M 14)	(M 15)	(M 16)
DV: progressive taxation				
Progressive welfare spending	-0.060***		-0.065***	
	(0.018)		(0.017)	
Concentration coefficient		0.026***		0.028***
		(0.005)		(0.005)
Top 10% household income	-0.353*	-0.648***	-0.409*	-0.648***
	(0.163)	(0.065)	(0.165)	(0.065)
Cross-level interaction terms				
Top 10% x Progressive welfare	-0.019*		-0.017+	
spending	(0.009)		(0.009)	
Top 10% x Concentration coefficient		0.004		0.004
		(0.003)		(0.003)
Micro controls				
Female	0.136***	0.140***	0.134***	0.140***
	(0.034)	(0.036)	(0.035)	(0.036)
Age	0.048***	0.046***	0.047***	0.046***
	(0.007)	(0.007)	(0.007)	(0.007)
Age2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.216***	-0.230***	-0.225***	-0.230***
	(0.037)	(0.039)	(0.037)	(0.039)
Employment status				
Part-time	0.002	0.033	-0.002	0.034
(Ref. Cat.: employed)	(0.056)	(0.059)	(0.056)	(0.059)
Unemployed	0.155+	0.189+	0.166+	0.187+
	(0.094)	(0.099)	(0.094)	(0.099)
Student	0.169	0.162	0.154	0.161
	(0.116)	(0.119)	(0.117)	(0.119)
Retired	0.116+	0.127+	0.129+	0.124+
	(0.068)	(0.071)	(0.069)	(0.071)
Housekeeping	-0.035	-0.018	-0.026	-0.018
	(0.067)	(0.070)	(0.068)	(0.070)
Education	-0.077***	-0.071***	-0.076***	-0.071***
	(0.013)	(0.014)	(0.014)	(0.014)
Unemployment risk	0.008*	0.008*	0.008*	0.008*
	(0.004)	(0.004)	(0.004)	(0.004)
Macro controls				
P90/P10			-0.163	-0.149

			(0.110)	(0.108)
Social spending per capita	-0.000	0.000	-0.000	-0.000
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.854*	-0.205	1.694*	0.552
	(0.372)	(0.296)	(0.736)	(0.618)
Random effects parameters				
Var (constant)	0.179**	0.113**	0.160**	0.102**
	(0.057)	(0.040)	(0.053)	(0.036)
N Level 1	17884	16267	17363	16267
N Level 2	21	18	20	18
ll	-10795.35	-9862.83	-10537.61	-9861.9227
BIC	21757.2	19890.5	21250.9	19898.4

Note: Standard errors in parentheses. + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; For Korea we lack information on housing, so that the progressive welfare spending ratio for Korea only contains ALMP, family allowances and 'other'. The results remain robust when we exclude Korea. The concentration coefficient is missing for SVN and ISR.

Source: ISSP 2006; ILO (2006); Solt (2009); OECD (2016).

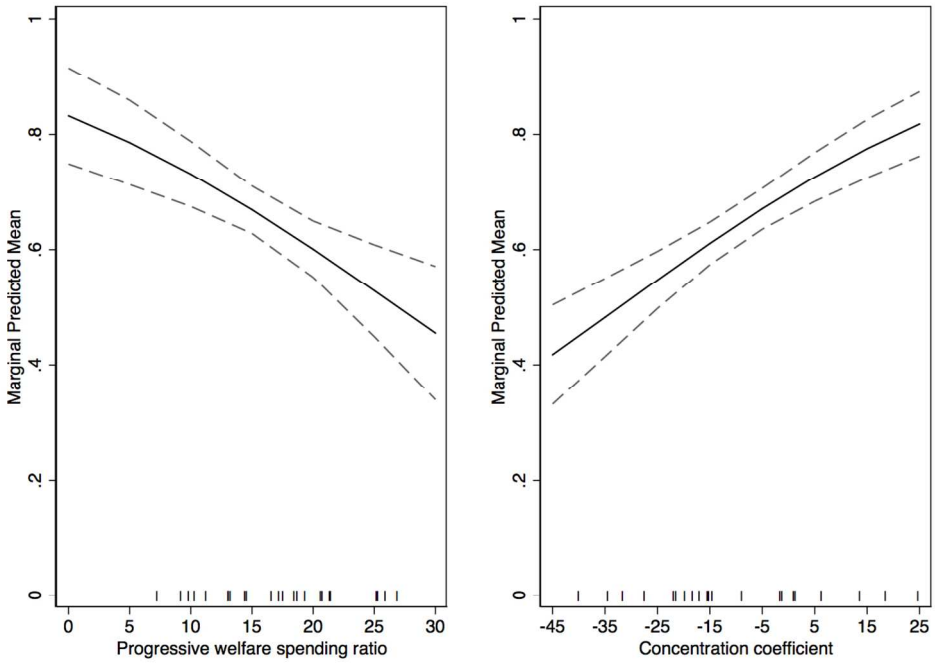

Figure 1: Predicted probabilities of the progressive welfare spending ratio (a) and the concentration coefficient (b) on support for progressive taxation

260x189mm (144 x 144 DPI)

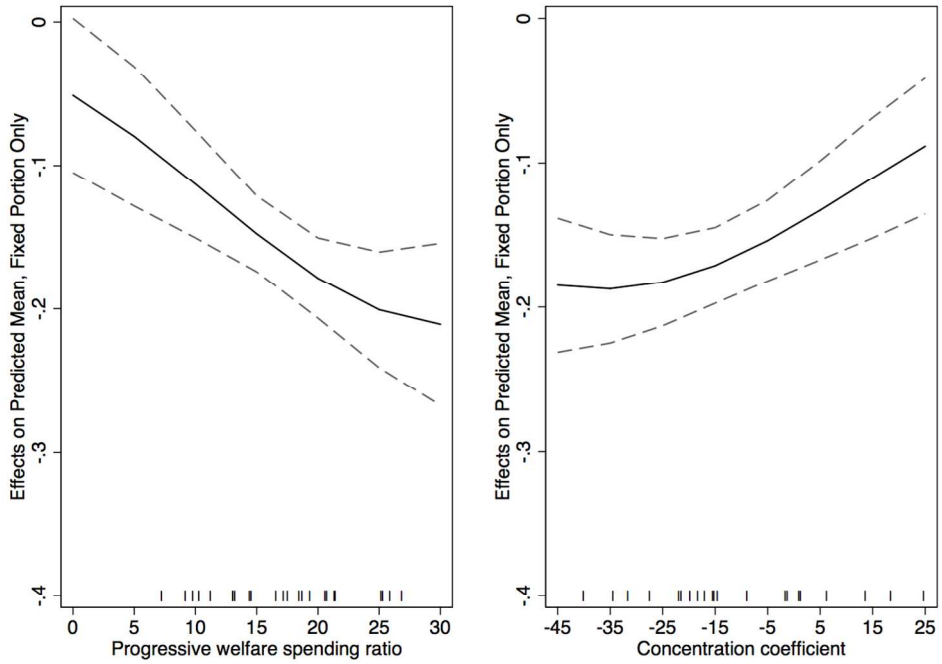

Figure 2: Average marginal effect of 10% of household income earner and progressive welfare spending ratio (a) and the concentration coefficient (b) on support for progressive taxation

260x189mm (144 x 144 DPI)

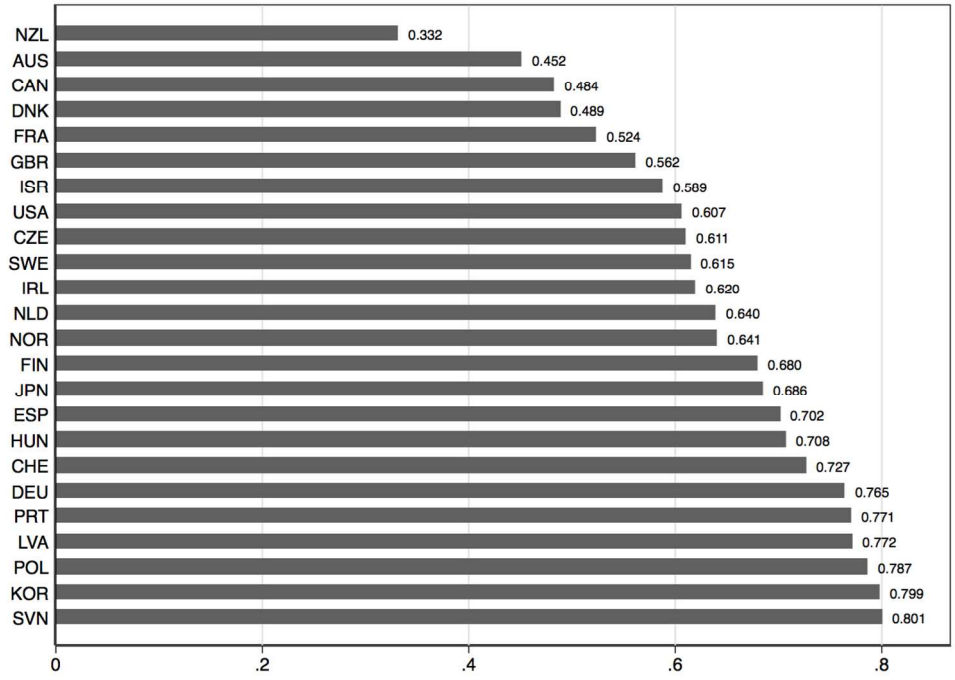

Figure A: Average support for progressive taxation across countries in % (ISSP 2006)

260x189mm (144 x 144 DPI)

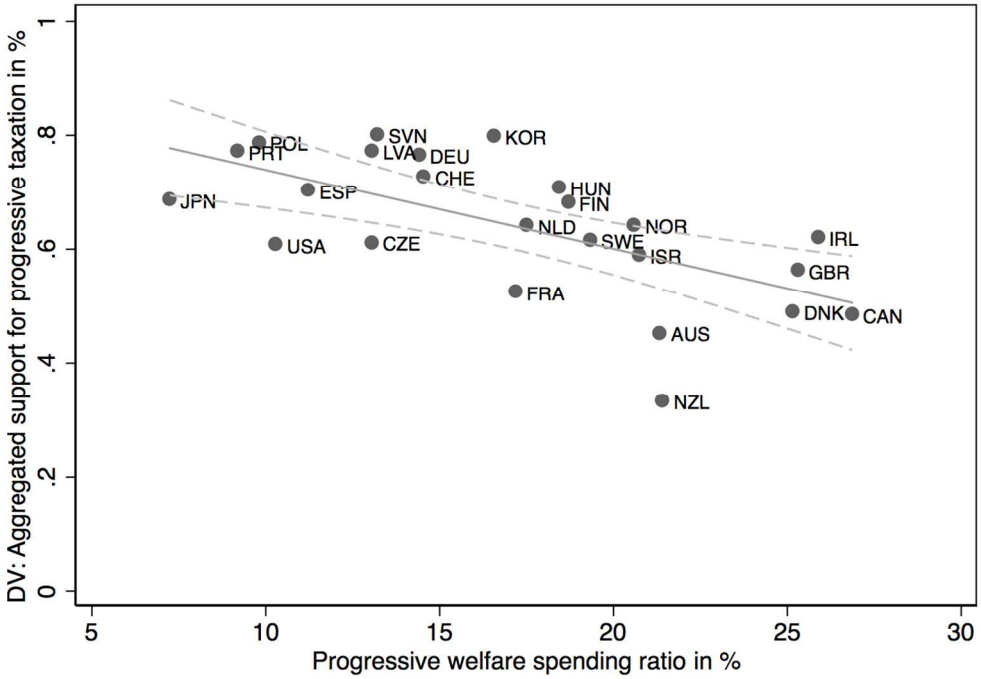

Figure B: Bivariate correlation between aggregated support for progressive taxation in % and progressive welfare spending ratio (ISSP 2006; OECD 2016)

260x189mm (144 x 144 DPI)

Table A: Descriptive Statistics

Variable	Obs	Mean	Std.	Min	Max
DV					
Progressive tax support	17,884	0.64	0.48	0	1
Micro					
Household income	17,884	1.06	0.81	0.01	37.29
Top 10% household income	17,884	0.12	0.32	0	1
Controls					
Femal	17,884	0.50	0.50	0	1
Age	17,884	48.06	15.87	16	97
Age2	17,884	2561.58	1606.93	256	9409
Married	17,884	0.63	0.48	0	1
Employment situation					
Employed	17,884	0.56	0.50	0	1
Part-time	17,884	0.11	0.31	0	1
Unemployed	17,884	0.04	0.19	0	1
Student	17,884	0.02	0.15	0	1
Retired	17,884	0.20	0.40	0	1
Housekeeping	17,884	0.08	0.26	0	1
Education	17,884	4.01	1.48	1	6
Unemployment risk	17,884	4.96	5.52	0.18	69.37
Tax level	17,884	3.44	0.60	1	5
Social trust	17,744	2.25	1.13	1	5
Religious	17,248	1.89	1.05	1	4
Political ideology					
Left	14,932	0.34	0.47	0	1
Center	14,932	0.22	0.41	0	1
Right	14,932	0.31	0.46	0	1
Not affiliated	14,932	0.14	0.34	0.00	1.00
Macro					
Progressive welfare spending ratio	17,884	-11.99	18.21	-40.02	24.73
Concentration coef.	16,267	-11.99	18.21	-40.02	24.73
Social spending per capita	17,884	6861.26	2784.07	1874.51	11757.58
Taxes on riches 10%	16,267	32.78	5.70	20.94	45.08
Gini market	17,884	47.21	5.35	33.8	58.57
P90/P10	17,363	4.034211	0.9525984	2.8	6.2

Source: ISSP 2006; ILO (2006); Solt (2009); OECD (2008); OECD (2016).

WELFARE STATE STRUCTURE, INEQUALITY, AND PUBLIC ATTITUDES TOWARDS PROGRESSIVE TAXATION

Supplementary Material

Table S1: Robustness test: Progressive spending ratios by type

DV: progressive taxation	(M 1)	(M 2)	(M 3)	(M 4)
Household income	-0.323***	-0.324***	-0.323***	-0.324***
	(0.028)	(0.028)	(0.028)	(0.028)
Female	0.145***	0.145***	0.145***	0.145***
	(0.035)	(0.035)	(0.035)	(0.035)
Age	0.049***	0.049***	0.049***	0.049***
	(0.007)	(0.007)	(0.007)	(0.007)
Age^2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.185***	-0.185***	-0.185***	-0.185***
	(0.038)	(0.038)	(0.038)	(0.038)
Employment status				
Part-time	-0.029	-0.030	-0.028	-0.029
(Ref. Cat.: employed)	(0.058)	(0.058)	(0.058)	(0.058)
Unemployed	0.117	0.117	0.117	0.116
	(0.098)	(0.098)	(0.098)	(0.098)
Student	-0.023	-0.020	-0.023	-0.023
	(0.126)	(0.126)	(0.126)	(0.126)
Retired	0.074	0.076	0.076	0.074
	(0.070)	(0.070)	(0.070)	(0.070)
Housekeeping	-0.092	-0.090	-0.091	-0.092
	(0.072)	(0.072)	(0.072)	(0.072)
Education	-0.069***	-0.069***	-0.069***	-0.069***
	(0.014)	(0.014)	(0.014)	(0.014)
Unemployment risk	0.007*	0.007*	0.008*	0.007*
	(0.004)	(0.004)	(0.004)	(0.004)
Macro predictors				
ALMP spending ratio	-0.024			
	(0.099)			
Family spending ratio		-0.078**		
		(0.026)		
Housing spending ratio			-0.216***	
			(0.060)	
Other welfare spending ratio				-0.040
				(0.036)
Gini market	0.017	0.023	0.032	0.013
	(0.029)	(0.023)	(0.022)	(0.028)
Constant	-0.947	-0.558	-1.420	-0.712
	(1.468)	(1.151)	(1.073)	(1.365)
Random effects parameters				
Var (constant)	0.289**	0.198**	0.173**	0.273**
	(0.094)	(0.065)	(0.057)	(0.089)
N Level 1	16558	16558	16558	16558
N Level 2	20	20	20	20
ll	-10152.07	-10148.44	-10147.06	-10151.52
BIC	20459.6	20452.3	20449.6	20458.5

Note: Standard errors in parentheses. + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; We use gini market instead of P90/P10 since P90/P10 values are not available for LVA. KOR is missing due to lack of data for housing.
Source: ISSP 2006; ILO (2016); OECD (2016).

Table S2: Robustness test: Different household income thresholds

	(M 5)	(M 6)	(M 7)	(M 8)	(M 9)	(M 10)
DV: progressive taxation						
Progressive welfare spending ratio	-0.064*** (0.017)		-0.063*** (0.017)		-0.064*** (0.017)	
Concentration coefficient		0.025*** (0.005)		0.025*** (0.005)		0.025*** (0.005)
Top 1% household income	-0.694+ (0.406)	-0.682*** (0.148)				
Top 5% household income			-0.428* (0.211)	-0.716*** (0.084)		
Top 25% household income					-0.363** (0.119)	-0.518*** (0.049)
Cross-level interaction terms						
Top 1% x progressive welfare	-0.007 (0.023)					
Top 1% x concentration coef.		0.012 (0.007)				
Top 5% x progressive welfare			-0.022+ (0.012)			
Top 5% x concentration coef.				0.007* (0.004)		
Top 25% x progressive welfare					-0.012+ (0.007)	
Top 25% x concentration coef.						0.005* (0.002)
Micro controls						
Female	0.144*** (0.034)	0.146*** (0.036)	0.136*** (0.034)	0.140*** (0.036)	0.137*** (0.034)	0.139*** (0.036)
Age	0.046*** (0.007)	0.044*** (0.007)	0.047*** (0.007)	0.046*** (0.007)	0.048*** (0.007)	0.047*** (0.007)
Age^2	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)	-0.000*** (0.000)
Married	-0.229*** (0.037)	-0.246*** (0.039)	-0.218*** (0.037)	-0.231*** (0.039)	-0.196*** (0.037)	-0.208*** (0.039)
Employment status						
Part-time (Ref. Cat.: employed)	0.036 (0.056)	0.067 (0.059)	0.016 (0.056)	0.046 (0.059)	-0.023 (0.056)	0.009 (0.059)
Unemployed	0.207* (0.093)	0.242* (0.098)	0.182+ (0.094)	0.217* (0.098)	0.084 (0.094)	0.123 (0.099)
Student	0.197+ (0.116)	0.190 (0.119)	0.184 (0.116)	0.180 (0.119)	0.110 (0.117)	0.101 (0.119)
Retired	0.196** (0.068)	0.206** (0.071)	0.148* (0.068)	0.161* (0.071)	0.076 (0.069)	0.088 (0.071)
Housekeeping	0.017 (0.067)	0.031 (0.069)	-0.014 (0.067)	-0.001 (0.070)	-0.082 (0.068)	-0.065 (0.070)
Education	-0.107*** (0.013)	-0.102*** (0.014)	-0.087*** (0.013)	-0.082*** (0.014)	-0.064*** (0.014)	-0.060*** (0.014)
Unemployment risk	0.010** (0.004)	0.010** (0.004)	0.009* (0.004)	0.009* (0.004)	0.007+ (0.004)	0.007* (0.004)
Constant	0.836* (0.340)	-0.007 (0.198)	0.751* (0.340)	-0.091 (0.198)	0.787* (0.347)	-0.081 (0.198)
Random effects parameters						
Var (constant)	0.182** (0.058)	0.115** (0.040)	0.181** (0.058)	0.111** (0.039)	0.189** (0.061)	0.112** (0.040)
N Level 1	17884	16267	17884	16267	17884	16267
N Level 2	21	18	21	18	21	18
ll	-10865.24	-9928.90	-10807.45	-9875.1549	-10772.46	-9840.148
BIC	21887.1	20013.0	21771.6	19905.5	21701.6	19835.4

Note: Standard errors in parentheses. + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001
Source: ISSP 2006; ILO (2016); OECD (2016).

Table S3: Robustness test: Personal income and low household income

	(M 11)	(M 12)	(M 13)	(M 14)
DV: progressive taxation				
Lowest 25% household income	-0.025	0.168**		
	(0.135)	(0.056)		
Top 10% personal income			-0.648***	-0.677***
			(0.175)	(0.071)
Progressive welfare spending ratio	-0.068***		-0.064***	
	(0.017)		(0.017)	
Concentration coefficient		0.026***		0.025***
		(0.005)		(0.005)
Cross-level interaction terms				
Lowest 25% household income x progressive welfare	0.015*			
	(0.007)			
Lowest 25% household income x concentration coefficient		-0.004		
		(0.002)		
Top 10% personal income x progressive welfare			-0.004	
			(0.010)	
Top 10% personal income x concentration coefficient				0.004
				(0.003)
Micro controls				
Female	0.146***	0.147***	0.110**	0.108**
	(0.034)	(0.036)	(0.037)	(0.038)
Age	0.046***	0.044***	0.049***	0.051***
	(0.007)	(0.007)	(0.007)	(0.008)
Age2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.189***	-0.205***	-0.295***	-0.307***
	(0.037)	(0.039)	(0.040)	(0.041)
Employment status				
Part-time	0.015	0.051	-0.018	0.022
(Ref. Cat.: employed)	(0.056)	(0.059)	(0.058)	(0.061)
Unemployed	0.130	0.176+	0.184	0.279*
	(0.095)	(0.100)	(0.117)	(0.122)
Student	0.109	0.110	0.071	0.067
	(0.117)	(0.120)	(0.134)	(0.135)
Retired	0.158*	0.172*	0.128+	0.182*
	(0.068)	(0.071)	(0.075)	(0.078)
Housekeeping	-0.042	-0.023	-0.076	-0.036
	(0.068)	(0.071)	(0.084)	(0.086)
Education	-0.101***	-0.096***	-0.083***	-0.078***
	(0.013)	(0.014)	(0.014)	(0.015)
Unemployment risk	0.009**	0.009**	0.014**	0.015**
	(0.004)	(0.004)	(0.005)	(0.005)
Constant	0.816*	-0.070	0.695+	-0.222
	(0.340)	(0.199)	(0.355)	(0.213)
Random effects parameters				
Var (constant)	0.180**	0.114**	0.190**	0.121**
	(0.058)	(0.040)	(0.061)	(0.043)
N Level 1	17884	16267	15811	14442
N Level 2	21	18	21	18
ll	-10869.95	-9935.95	-9607.97	-8830.42
BIC	21896.6	20027.0	19370.6	17814.1

Note: Standard errors in parentheses. + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001
Source: ISSP 2006; ILO (2016); OECD (2016).

Table S4: Robustness test: Social affinity (P90/P50), negative externalities (homicide rate) and taxes (fiscal freedom)

DV: progressive taxation	(M 15)	(M 16)	(M17)	(M 18)	(M 19)	(M 20)
Progressive welfare spending	-0.070***		-0.072***		-0.069***	
	(0.017)		(0.015)		(0.018)	
Concentration coefficient		0.032***		0.029***		0.029***
		(0.005)		(0.004)		(0.005)
Household income	-0.313***	-0.299***	-0.360***	-0.348***	-0.313***	-0.300***
	(0.027)	(0.028)	(0.029)	(0.030)	(0.027)	(0.028)
Micro controls						
Female	0.136***	0.141***	0.143***	0.148***	0.136***	0.140***
	(0.035)	(0.036)	(0.036)	(0.037)	(0.035)	(0.036)
Age	0.048***	0.047***	0.050***	0.049***	0.048***	0.047***
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Age^2	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.205***	-0.210***	-0.191***	-0.197***	-0.205***	-0.210***
	(0.037)	(0.039)	(0.038)	(0.040)	(0.037)	(0.039)
Employment status						
Part-time	-0.020	0.023	-0.040	0.006	-0.020	0.022
(Ref. Cat.: employed)	(0.057)	(0.059)	(0.059)	(0.061)	(0.057)	(0.059)
Unemployed	0.089	0.118	0.117	0.151	0.088	0.117
	(0.095)	(0.099)	(0.098)	(0.103)	(0.095)	(0.099)
Student	0.070	0.079	-0.047	-0.044	0.071	0.081
	(0.117)	(0.120)	(0.127)	(0.130)	(0.117)	(0.120)
Retired	0.115+	0.115	0.083	0.080	0.114+	0.114
	(0.069)	(0.071)	(0.071)	(0.073)	(0.069)	(0.071)
Housekeeping	-0.076	-0.062	-0.096	-0.082	-0.076	-0.063
	(0.068)	(0.070)	(0.073)	(0.075)	(0.068)	(0.070)
Education	-0.069***	-0.066***	-0.064***	-0.060***	-0.068***	-0.065***
	(0.014)	(0.014)	(0.014)	(0.015)	(0.014)	(0.014)
Unemployment risk	0.008*	0.008*	0.007*	0.007*	0.008*	0.008*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Macro controls						
P90/P50	-0.537	-0.921*				
	(0.426)	(0.360)				
P90/P10			-0.151	-0.219*	-0.123	-0.182+
			(0.106)	(0.093)	(0.106)	(0.109)
Homicide rate			0.019	0.069		
			(0.088)	(0.065)		
Fiscal Freedom					0.003	0.007
					(0.010)	(0.008)
Constant	2.101*	1.935**	1.569**	0.802*	1.339+	0.463
	(0.962)	(0.736)	(0.537)	(0.394)	(0.779)	(0.520)
Random effects parameters						
Var (constant)	0.167	0.081	0.122	0.062	0.169	0.097
	(0.055)	(0.029)	(0.042)	(0.024)	(0.055)	(0.034)
N Level 1	17363	16267	16037	14941	17363	16267
N Level 2	20	18	19	17	20	18
ll	-10552.84	-9877.93	-9878.73	-9205.17	-10552.96	-9879.44
BIC	21261.9	19911.0	19922.1	18573.7	21271.9	19923.7

Note: Standard errors in parentheses. + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001

Source: ISSP 2006; ILO (2006); Solt (2009); OECD (2016); World Bank (2016); Heritage Foundation (2017).

Table S5: Robustness: Test: Logistic hierarchical regression on support for progressive taxation with control for tax progressivity

	(M 21)	(M 22)	(M 23)	(M 24)	(M 25)	(M 26)
DV: progressive taxation						
Progressive welfare spending	-0.057**		-0.063***		-0.063**	
	(0.019)		(0.016)		(0.020)	
Concentration coefficient		0.030***		0.027***		0.027***
		(0.006)		(0.004)		(0.005)
Household income	-0.372***	-0.372***	-0.298***	-0.299***	-0.298***	-0.299***
	(0.033)	(0.033)	(0.028)	(0.028)	(0.028)	(0.028)
Micro controls						
Female	0.174***	0.174***	0.141***	0.141***	0.141***	0.141***
	(0.039)	(0.039)	(0.036)	(0.036)	(0.036)	(0.036)
Age	0.040***	0.040***	0.047***	0.047***	0.047***	0.047***
	(0.008)	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)
Age2	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.212***	-0.214***	-0.209***	-0.211***	-0.209***	-0.211***
	(0.042)	(0.042)	(0.039)	(0.039)	(0.039)	(0.039)
Employment status						
Part-time	-0.007	-0.005	0.017	0.020	0.017	0.020
(Ref. Cat.: employed)	(0.062)	(0.062)	(0.059)	(0.059)	(0.059)	(0.059)
Unemployed	0.250*	0.249*	0.124	0.121	0.124	0.121
	(0.126)	(0.126)	(0.099)	(0.099)	(0.099)	(0.100)
Student	0.030	0.034	0.075	0.080	0.075	0.080
	(0.122)	(0.122)	(0.120)	(0.120)	(0.120)	(0.120)
Retired	0.090	0.088	0.120+	0.118+	0.120+	0.118+
	(0.078)	(0.078)	(0.071)	(0.071)	(0.071)	(0.071)
Housekeeping	-0.105	-0.102	-0.066	-0.061	-0.066	-0.061
	(0.074)	(0.074)	(0.070)	(0.070)	(0.070)	(0.070)
Education	-0.068***	-0.068***	-0.066***	-0.065***	-0.066***	-0.065***
	(0.015)	(0.015)	(0.014)	(0.014)	(0.014)	(0.014)
Unemployment risk	0.009*	0.008*	0.008*	0.008*	0.008*	0.008*
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Macro controls						
Tax concentration coef.	-2.317+	-1.666+				
	(1.219)	(0.907)				
Taxes on the richest 10%			-0.032+	-0.031*	-0.032	-0.030+
			(0.017)	(0.012)	(0.021)	(0.015)
P90/P10					0.000	-0.006
					(0.162)	(0.111)
Constant	1.955**	1.131**	1.933**	1.112*	1.933*	1.120*
	(0.619)	(0.431)	(0.640)	(0.442)	(0.759)	(0.469)
Random effects parameters						
Var (constant)	0.177	0.091	0.156	0.082	0.156	0.082
	(0.067)	(0.036)	(0.054)	(0.029)	(0.054)	(0.029)
N Level 1	13533	13533	16267	16267	16267	16267
N Level 2	15	15	18	18	18	18
ll	-8256.7205	-8252.3247	-9883.512	-9878.0416	-9883.512	-9878.0403
BIC	16665.6	16656.9	19922.2	19911.2	19931.9	19920.9

Note: + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; Standard errors in parentheses. The tax concentration coefficient is missing for: ESP; HUN, ISR, LVA, PRT and SVN.
Source: ISSP 2006; ILO (2006); OECD (2016).

Table S6: Robustness test: Logistic hierarchical regression on support for progressive taxation without unemployment risk control

	(M 27)	(M 28)	(M 29)	(M 30)
DV: progressive taxation				
Progressive welfare spending	-0.060***		-0.059***	
	(0.015)		(0.015)	
Concentration coefficient		0.023***		0.022***
		(0.005)		(0.005)
Household income	-0.260***	-0.324***		
	(0.021)	(0.025)		
Top 10% household income			-0.579***	-0.686***
			(0.148)	(0.057)
Cross-level interaction terms				
Top 10% x Progressive welfare spending			-0.006	
			(0.008)	
Top 10% x Concentration coefficient				0.003
				(0.003)
Micro controls				
Female	0.127***	0.132***	0.125***	0.133***
	(0.030)	(0.032)	(0.030)	(0.032)
Age	0.045***	0.045***	0.045***	0.044***
	(0.006)	(0.006)	(0.006)	(0.006)
Age2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.172***	-0.188***	-0.190***	-0.213***
	(0.032)	(0.034)	(0.032)	(0.034)
Employment status				
Part-time	0.003	0.013	0.015	0.031
(Ref. Cat.: employed)	(0.050)	(0.053)	(0.050)	(0.053)
Unemployed	0.107	0.135	0.167*	0.219**
	(0.079)	(0.086)	(0.078)	(0.085)
Student	0.044	0.011	0.085	0.073
	(0.078)	(0.084)	(0.078)	(0.084)
Retired	0.060	0.044	0.073	0.068
	(0.058)	(0.061)	(0.058)	(0.061)
Housekeeping	-0.133*	-0.140*	-0.091+	-0.084
	(0.052)	(0.056)	(0.052)	(0.056)
Education	-0.076***	-0.076***	-0.082***	-0.085***
	(0.011)	(0.012)	(0.011)	(0.012)
Macro controls				
Gini market	-0.013	-0.037*	-0.014	-0.038*
	(0.017)	(0.018)	(0.017)	(0.018)
Constant	1.612+	1.902*	1.435+	1.728+
	(0.870)	(0.898)	(0.862)	(0.885)
Random effects parameters				
Var (constant)	0.167	0.125	0.163	0.121
	(0.049)	(0.040)	(0.048)	(0.039)
N Level 1	23675	20761	23675	20761
N Level 2	25	21	25	21
ll	-14499.24	-12729.80	-14474.15	-12715.95
BIC	29149.6	25608.7	29109.5	25591.0

Note: + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; Standard errors in parentheses. Unemployment risk and P90/P10 are excluded from the model in this specification to test the robustness of the independent variables with more cases at level two. Moreover, we keep Chile in the model and relax the restriction to focus on a comparable set of high-income democracies.
Source: ISSP 2006; OECD (2016).

Figure S1: Average marginal effect of 10% of household income earner and progressive welfare spending ratio (a) and the concentration coefficient with N=21 (b) on support for progressive taxation with N=25

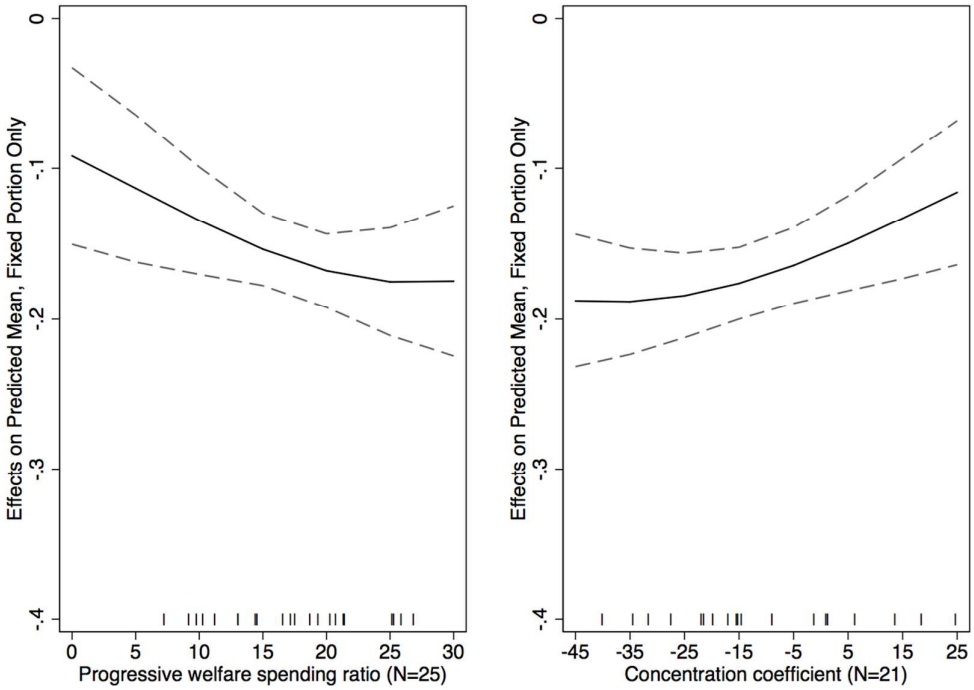

Table S7: Robustness test: Influential cases

	(M 1)	(M 2)	(M 3)	(M 4)
DV: progressive taxation				
Progressive welfare spending	-0.065***		-0.062***	
	(0.013)		(0.013)	
Concentration coefficient		0.022***		0.020***
		(0.004)		(0.004)
Household income	-0.288***	-0.309***		
	(0.029)	(0.031)		
Top 10% household income			-0.237	-0.639***
			(0.179)	(0.071)
Cross-level interaction terms				
Top 10% x Progressive welfare spending			-0.025*	
			(0.010)	
Top 10% x Concentration coefficient				0.004
				(0.003)
Micro controls				
Female	0.144***	0.147***	0.142***	0.148***
	(0.037)	(0.038)	(0.037)	(0.039)
Age	0.051***	0.051***	0.051***	0.050***
	(0.007)	(0.007)	(0.007)	(0.007)
Age2	-0.000***	-0.000***	-0.000***	-0.000***
	(0.000)	(0.000)	(0.000)	(0.000)
Married	-0.172***	-0.185***	-0.195***	-0.207***
	(0.039)	(0.041)	(0.039)	(0.041)
Employment status				
Part-time	-0.016	0.024	-0.002	0.038
(Ref. Cat.: employed)	(0.062)	(0.066)	(0.062)	(0.066)
Unemployed	0.133	0.173+	0.202*	0.245*
	(0.098)	(0.104)	(0.097)	(0.102)
Student	0.017	-0.001	0.091	0.087
	(0.127)	(0.131)	(0.126)	(0.130)
Retired	0.099	0.109	0.110	0.123
	(0.071)	(0.075)	(0.071)	(0.075)
Housekeeping	-0.034	-0.022	0.006	0.028
	(0.074)	(0.077)	(0.073)	(0.077)
Education	-0.075***	-0.068***	-0.080***	-0.074***
	(0.015)	(0.015)	(0.014)	(0.015)
Unemployment risk	0.007+	0.006+	0.007+	0.007+
	(0.004)	(0.004)	(0.004)	(0.004)
Constant	0.908**	-0.057	0.617*	-0.299
	(0.289)	(0.198)	(0.289)	(0.198)
Random effects parameters				
Var (constant)	0.088**	0.055*	0.087**	0.055*
	(0.031)	(0.022)	(0.031)	(0.022)
N Level 1	15386	13769	15386	13769
N Level 2	18	15	18	15
ll	-9437.90	-8502.22	-9416.38	-8486.49
BIC	19020.4	17147.4	18987.0	17125.5

Note: + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; Standard errors in parentheses. To study the impact of possible influential cases we exclude NZL and JPN which receive dfbetas above and below the cutoff points and KOR which is outside of the boxplot but still in the dfbetas cutoff-interaval.

Source: ISSP 2006; ILO (2006); OECD (2016).

Figure S2: Variance of the random intercepts

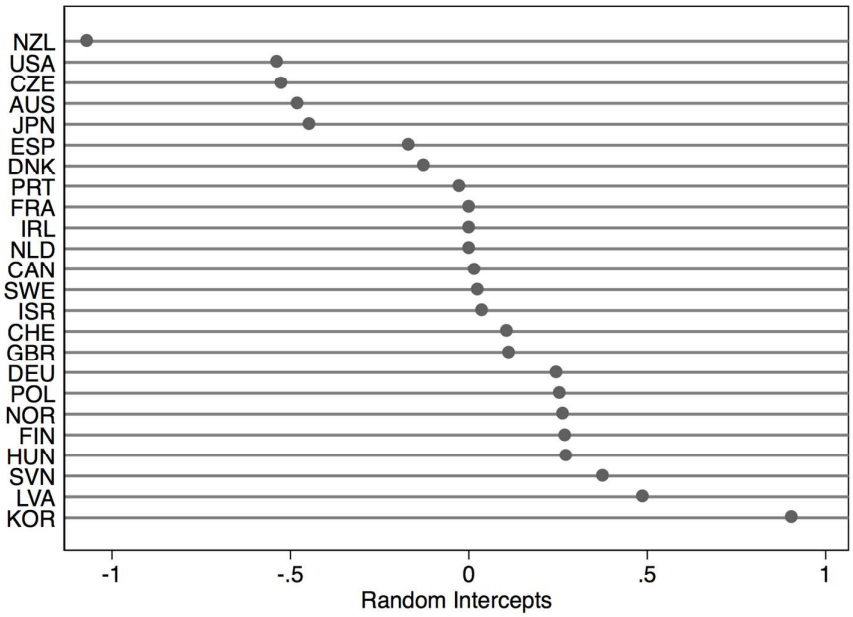

Table S8: Estimation results for Model 1 Table 1 excluding one level-two case at a time

DV: *progressive taxation*	FULL	AUS	CAN	CZE	DNK	FIN	DEU	HUN	ISR	JPN	KOR
Household income	-0.2858***	-0.2729***	-0.2833***	-0.2769***	-0.2588***	-0.3090***	-0.2680***	-0.3245***	-0.2720***	-0.2723***	-0.3263***
Female	0.1273***	0.1413***	0.1376***	0.1405***	0.1071**	0.1173***	0.1234***	0.1349***	0.1327***	0.1237***	0.1356***
Age	0.0442***	0.0467***	0.0461***	0.0447***	0.0411***	0.0431***	0.0462***	0.0457***	0.0434***	0.0453***	0.0474***
Age2	-0.0003***	-0.0004***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***
Married	-0.2038***	-0.1788***	-0.2055***	-0.2202***	-0.2041***	-0.1953***	-0.2267***	-0.2209***	-0.2033***	-0.2035***	-0.1889***
Employed	-0.022	-0.0245	-0.0058	-0.01	-0.0302	-0.0003	-0.0198	-0.0159	-0.0364	-0.0439	-0.0012
Education	-0.0711***	-0.1018***	-0.0712***	-0.0689***	-0.0765***	-0.0557***	-0.0684***	-0.0680***	-0.0709***	-0.0737***	-0.0677***
Unemployment risk	0.0077*	0.0057	0.0071*	0.0072*	0.0071*	0.0064	0.0074*	0.0085*	0.0082*	0.0071*	0.0073*
Progressive welfare spending	-0.0633***	-0.0576**	-0.0627**	-0.0657***	-0.0625***	-0.0644***	-0.0604**	-0.0648***	-0.0627***	-0.0723***	-0.0688***
Social spending per capita	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Constant	1.2183**	1.2369***	1.1610**	1.3069***	1.3134**	1.2456***	1.1545**	1.1931**	1.2173**	1.3621***	0.9220*
Var(Constant)	-0.8479***	-0.8813***	-0.8237***	-0.8731***	-0.8302***	-0.8412***	-0.8435***	-0.8330***	-0.8243***	-0.8741***	-0.9423***

	LVA	NZL	NOR	POL	PRT	SVN	ESP	SWE	CHE	GBR	USA
Household income	-0.3155***	-0.2682***	-0.3047***	-0.2919***	-0.2905***	-0.2838***	-0.2958***	-0.2741***	-0.2804***	-0.2654***	-0.2715***
Female	0.1243***	0.1297***	0.1115**	0.1177***	0.1373***	0.1275***	0.1316***	0.1247***	0.1301***	0.1328***	0.1147**
Age	0.0441***	0.0445***	0.0458***	0.0453***	0.0400***	0.0451***	0.0421***	0.0438***	0.0454***	0.0429***	0.0416***
Age^2	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***	-0.0003***
Married	-0.2111***	-0.1934***	-0.2111***	-0.2160***	-0.1981***	-0.2075***	-0.1955***	-0.1992***	-0.2195***	-0.1831***	-0.1887***
Employed	-0.0173	-0.0267	-0.0252	-0.0169	-0.0222	-0.028	-0.0092	-0.0263	-0.0394	-0.02	-0.0335
Education	-0.0672***	-0.0746***	-0.0727***	-0.0683***	-0.0687***	-0.0691***	-0.0789***	-0.0540***	-0.0683***	-0.0657***	-0.0750***
Unemployment risk	0.0076*	0.0074*	0.0069*	0.0069	0.0079*	0.0077*	0.0074*	0.0075*	0.0073*	0.0373***	0.0072*
Progressive welfare spending	-0.0629***	-0.0512***	-0.0640***	-0.0614**	-0.0636***	-0.0614***	-0.0645***	-0.0640***	-0.0626***	-0.0581**	-0.0704***
Social spending per capita	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Constant	1.1244**	1.1785***	1.3237***	1.1283**	1.2932**	1.1335**	1.3162***	1.1926**	1.1951**	0.9392*	1.3753***
Var(Constant)	-0.8519***	-1.0897***	-0.8528***	-0.8291***	-0.8281***	-0.8454***	-0.8280***	-0.8257***	-0.8269***	-0.8473***	-0.8678***

Note: * p<0.05, ** p<0.01, *** p<0.001; We use the STATA command `mltcooksd` and `mltshowm, all` in STATA version 14 to display the estimation results with automatic exclusion of level two cases one at a time. Above each column we indicate which country is excluded from the model shown underneath. As the command does not function with factor variables we employ a dummy for employment (1= employed, 0=all else). Since the employment categories are mostly insignificant in all estimations, we employ this simplification.
Source: ISSP 2006; ILO (2006); OECD (2016).

Table S9: Robustness test: Boostrapping

	(M 35)
DV: progressive taxation	
Progressive welfare spending	-0.067***
	(0.012)
Household income	-0.284***
	(0.082)
Micro controls	
Female	0.138***
	(0.041)
Age	0.048***
	(0.009)
Age2	-0.000***
	(0.000)
Married	-0.197***
	(0.056)
Employment status	
Part-time	-0.011
(Ref. Cat.: employed)	(0.071)
Unemployed	0.089
	(0.108)
Student	0.095
	(0.167)
Retired	0.107
	(0.108)
Housekeeping	-0.073
	(0.077)
Education	-0.072*
	(0.037)
Unemployment risk	0.008
	(0.017)
Constant	1.008**
	(0.339)
Random effects parameters	
Var (constant)	0.185
	(0.055)
N Level 1	17884
N Level 2	21
ll	-10817.32
Replications	999

Note: + p<0.10 , * p<0.05, ** p<0.01, *** p<0.001; Boostrapped standard errors are in parentheses. One or more parameters could not be estimated in 1 bootstrap replicate. Standard-error estimates include the 999 complete replications.

Source: ISSP 2006; ILO (2006); OECD (2016).